Claims:

1. Semiconductor laser device comprising

- a semiconductor laser element (1) with at least one exit surface (5) from which laser light can emerge, which in a first direction (Y) has greater divergence than in the second direction which is perpendicular to it;
- at least one reflection means (3, 9) which is located spaced apart from the exit surface (5) outside of the semiconductor laser element (1), with a reflecting surface (4, 10) which can reflect back at least parts of the light which has emerged from the semiconductor laser element (1) through the exit surface (5) into the semiconductor laser element (1) such that the mode spectrum of the semiconductor laser element (1) is influenced thereby;
- and a lens means (2) which is located between the reflection means (3, 9) and the semiconductor laser element (1) and which can at least partially reduce the divergence of the laser light at least in the first direction (Y),

characterized in that

- the reflecting surface (4, 10) of the reflection means (3, 9) is concavely curved.

2. Semiconductor laser device as claimed in claim 1, wherein the reflecting surface (4, 10) is spherically curved.

3. Semiconductor laser device as claimed in one of claims 1 or 2, wherein the reflecting surface (4, 10) in the first direction (Y) and in the second direction which is perpendicular to it has a curvature of essentially the same size.

4. Semiconductor laser device as claimed in one of claims 1 or 2, wherein the reflecting surface (4, 10) in the first direction (Y) and in the second direction which is perpendicular to it

has curvatures of differing magnitude.

5. Semiconductor laser device as claimed in one of claims 1 to 4, wherein the optical distance (D) between the reflecting surface (4, 10) and the exit surface (5) of the semiconductor laser element (1) is essentially equal to the focal length (F) of the reflecting surface (4, 10) with respect to at least one of the directions (Y).

6. Semiconductor laser device as claimed in the preamble of claim 1, wherein the exit surface (5) of the semiconductor laser element facing the reflection means (3, 9) has a width of more than 200 microns and the reflecting surface (4, 10) is not curved or is curved only insignificantly.

7. Semiconductor laser device as claimed in claim 6, wherein the exit surface (5) has a width of more than 500 microns, especially more than 1 mm.

8. Semiconductor laser device as claimed in one of claims 6 or 7, wherein the reflecting surface (4, 10) or at least one of the reflecting surfaces (4, 10) is made as a wavelength-sensitive element, especially as a grating.

9. Semiconductor laser device as claimed in one of claims 1 to 8, wherein the optical distance (D) and/or the curvature of the reflecting surface (4, 10) are chosen such that the beam waist on the exit surface (5) of at least the component beams (6, 7) of the light which has been reflected back to the semiconductor laser element (1) corresponds essentially to that aperture which is formed by the exit surface (5).

10. Semiconductor laser device as claimed in one of claims 2 to 9, wherein the semiconductor laser element (1) is made as a broad strip emitter.

11. Semiconductor laser device as claimed in claim 10, wherein the semiconductor laser element (1) is made as a bar or stack of broad strip emitters.

12. Semiconductor laser device as claimed in one of claims 1 to 11, wherein the exit

surface (5) of the semiconductor laser element (1) facing the reflecting surface (4, 10) is coated with an antireflective coating.

13. Semiconductor laser device as claimed in one of claims 1 to 12, wherein the semiconductor laser device comprises two reflection means (3, 9) with two reflecting surfaces (4, 10), the two reflecting surfaces (4,10) each being tilted at oppositely equal angles (α) to the normal (8) on the exit surface (5).

14. Semiconductor laser device as claimed in claim 13, wherein the two reflecting surfaces (4, 10) of the two reflection means (3, 9) have the same optical distance (D) to the exit surface (5) of the semiconductor laser element (1).

15. Semiconductor laser device as claimed in one of claims 13 or 14, wherein at least one of the reflecting surfaces (4, 10) of the reflection means (3, 9) is made as a partially reflecting surface so that at least one reflection means (9) which is provided with a partially reflecting surface (10) is used as a decoupler.

16. Semiconductor laser device as claimed in one of claims 13 or 14, wherein the two reflecting surfaces (4, 10) of the reflection means (3, 9) are made highly reflecting, the exit surface (13) of the semiconductor laser element (1) facing away from the reflecting surfaces (4, 10) being made partially reflecting and being used as a decoupler in this way.

17. Semiconductor laser device as claimed in one of claims 1 to 12, wherein between the semiconductor laser element (1) and the reflection means (3) there is a deflection means which can deflect onto the reflection means (3) the component beams (6, 7) which are emerging at an angle (α) to the normal (8) on the exit surface (5) from the latter.

18. Semiconductor laser device as claimed in claim 17, wherein the deflection means and the reflection means (3) are located on the axis which is dictated by the middle perpendicular on the exit surface (5).

19. Semiconductor laser device as claimed in one of claims 17 or 18, wherein the deflection means is made as a prism element (15).

20. Semiconductor laser device as claimed in claim 19, wherein the prism element (15) is arranged such that the leg surfaces (17) are facing the exit surface (5) of the semiconductor element.

21. Semiconductor laser device as claimed in one of claims 18 to 20, wherein by the suitable choice of the angle (β) between the hypotenuse surface (16) and the leg surfaces (17) of the prism element (15) and/or by the suitable choice of the position of the prism element (15) between the exit surface (5) and the reflecting surface (4) component beams (6, 7) which emerge at an angle ($\pm \alpha$) relative to the normal (8) on the exit surface (5) from the latter can be transferred into one another by the reflecting surface (4) of the reflection means (3).

22. Semiconductor laser device as claimed in one of claims 17 to 21, wherein the reflecting surface (4) of the reflection means (3) is made partially reflective so that the reflection means (3) can be used as a decoupler.

23. Semiconductor laser device as claimed in one of claims 17 to 21, wherein the reflecting surface (4) of the reflection means (3) is made highly reflecting, the exit surface (13) of the semiconductor laser element (1) facing away from the reflecting surface (4) being made partially reflecting and in this way being able to be used as a decoupler.

24. Semiconductor laser device as claimed in one of claims 1 to 23, wherein between the semiconductor laser element (1) and the reflection means (3, 9) there is a wavelength-selective element (12) which is made especially as an etalon.

25. Semiconductor laser device as claimed in one of claims 1 to 24, wherein the lens means (2) is made as a cylinder lens with a cylinder axis which extends essentially in the second direction which is perpendicular to the first direction (Y).

26. Semiconductor laser device as claimed in one of claims 1 to 25, wherein the lens means (2) is made such that the laser light which has emerged from the exit surface (5) after passing through the lens means (2) in the first direction (Y) has a divergence of roughly the same magnitude as in the second direction which is perpendicular thereto.

27. Semiconductor laser device as claimed in one of claims 1 to 26, wherein the semiconductor laser element (1) is exposed to a voltage and is supplied with current for producing electron-hole pairs only in partial areas which correspond to the three-dimensional extension of the desired mode of the laser light.